DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.
Loc =Geographical location. O=west longitude. N=north latitude. S=south latitude.
Call =Call letters assigned.
System =Radio system used and sparks per second.
Range =Normal range in nautical miles.

W. l. =Wave lengths assigned: Normal wave lengths in italics.
Service =Nature of service maintained:
PG=General public.
PR=Limited public.
RC=Radio compass station.
FS=Fog signal.
P=Private.
O=Government business exclusively.
Hours =Hours of operation:
N=Continuous service.
X=No regular hours.
m=a. m. (12 m=midday).
s=p. m. (12 s=midnight).
Rates =Ship or coast charges in cents: c.=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co.=Independent Wireless Telegraph Co.
R. C. A. =Radio Corporation of America.
S. O. R. S. =Ship Owners' Radio Service.
C. w. =Continuous wave.
I. c. w. =Interrupted continuous wave.
V. t. =Vacuum tube.
FX =Fixed station.
U. S. L. =After operating company denotes that the change applies only to the List of Radio Stations of the United States.
Kc. =Kilocycles.
Fy. =Frequency.

NEW STATIONS.

Commercial land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Bowling Green, Ky.[1]	WJAV	1,700	FX	X	Indian Pipe Line Corp.

[1] Loc. (approximately) 86° 30' 00", N. 36° 58' 00"; range, 300; system, DeForest telephone and telegraph; rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates.	Service.	Hours.	Owner of vessel.	Station controlled by—
B. H. Taylor	KFLK		PG	X	Bradley Transpa. Co.	R. C. A.
Blossom[1]	KFLG	6	PG	X	Cleveland Museum of Natural History.	Do.
Columbia	KFLI		PG	X	Chesley Tug & Barge Co.	
Frontenac[2]	KFLJ		PG	X	Cleveland Cliffs S. S. Co.	Owner of vessel.
Ishpeming[3]	KFLL		PG	X	do	Do.
J. H. Sheadle[3]	KFLM		PG	X	do	Do.
Michigan[3]	KFLN		PG	X	do	Do.
Peter White[3]	KFLO		PG	X	do	Do.
Ripple[1]	KFLF	6	PG	X	Clifford M. Leonard	Do.

[1] Range, 300; system, R. C. A., 1000; w. l., 300, 450, 600, 700.
[2] Range, 150; system, Navy R. C. A., 1000; w. l., 300, 600, 700; rates, Great Lakes service, 2 cents per word.
[3] Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600, 700; rates, Great Lakes service, 2 cents per word.

Commercial land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name.		Call signal.	Name.	
KFLF	Ripple	b	KFLL	Ishpeming	b
KFLG	Blossom	b	KFLM	J. H. Sheadle	b
KFLI	Columbia	b	KFLN	Michigan	b
KFLJ	Frontenac	b	KFLO	Peter White	b
KFLK	B. H. Taylor	b	WJAV	Bowling Green, Ky.	c

Broadcasting stations, alphabetically by names of cities.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923.]

City.	Call signal.	City.	Call signal.
Albuquerque, N. Mex.	KFLB	Little Rock, Ark.	KFLQ
Butte, Mont.	KFKV	Menominee, Mich.	KFLE
Do.	KFLA	Oak Park, Ill.	WTAY
Colorado Springs, Colo.	KFKZ	Pomeroy, Ohio	WHAZ
Conway, Ark.	KFKQ	Port Chester, N. Y.	WSAY
Cedar Rapids, Iowa	KFLF	Salt Lake City, Utah	KFLH
Franklinton, La.	KFLD	Streator, Ill.	WTAX
Lake Forest, Ill.	WABA	Trenton, N. J.	WWAR
Lambertville, N. J.	WTAZ		

Stations broadcasting market or weather reports, music, concerts, lectures, etc., alphabetically by call letters.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923.]

Call signal.	Station operated and controlled by—	Location of station.	Power (watts).	Wave length.	Frequency (kilocycles).
KFKQ	Conway Radio Laboratories (Ben H. Woodruff).	Conway, Ark.	100	234	1,340
KFKV	F. F. Gray	Butte, Mont., 2320 Richardson Street.	50	268	1,050
KFKZ	Nasour Bros. Radio Co.	Colorado Springs, Colo.	10	234	1,280
KFLA	Abner R. Wilson	Butte, Mont., 1320 West Platinum Street.	5	268	1,000
KFLD	Signal Electric Manufacturing Co.	Menominee, Mich.	20	345	1,210
KFLD	Paul E. Greenlaw	Frankfinton, La.	20	234	1,280
KFLH	Erickson Radio Co.	Salt Lake City, Utah	50	261	1,150
KFLP	Everette M. Foster	Cedar Rapids, Iowa	20	240	1,240
KFLQ	Bizzell Radio Shop	Little Rock, Ark.	20	261	1,150
KFLR	University of New Mexico	Albuquerque, N. Mex.	100	234	1,280
WABA	Lake Forest College	Lake Forest, Ill.	100	265	1,130
WHAY	Irving Austin (Port Chester Chamber of Commerce).	Port Chester, N. Y.	100	233	1,290
WZAZ	Chase Electric Shop	Pomeroy, Ohio	50	239	1,180
WTAX	Williams Hardware Co.	Streator, Ill.	20	231	1,300
WEAY	Iodar-Oak Leaves Broadcasting Station.	Oak Park, Ill.	15	226	1,330
WTAZ	Thomas J. McGuire	Lambertville, N. J.	15	273	1,090
WWAB	Hornig, Swarz & Co. (John Rasmussen).	Trenton, N. J.	10	226	1,330

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Boston Light Vessel [1]	NADX	1,000	FS		Lighthouse Service, Department of Commerce.
Pollock Rip Shoe Light Vessel.[2]	NAFT	300, 375, 475 600, 700, 800.			Do.
Schenectady, N. Y.	WWS		FX	X	Post Office Department.

[1] Lon. 0.70° 45' 28", N. 42° 20' 22"; service, this station is used as a fog signal only.
[2] Lon. 0.69° 52' 47", N. 41° 39' 40"; service, this station is open to relaying public correspondence in emergencies; hours, first 15 minutes every hour between 8 a. m. and 9.15 p. m.

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Basilan	KZAF		O	X	Philippine Insular Government.
Culebra	WYCL		O	X	U. S. Army.

Government land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name of station.	Call signal.	Name of station.
KZAF	Basilan b	WWS	Schenectady, N. Y. c
NADX	Boston Light Vessel c	WYCL	Culebra b
NAFT	Pollock Rip Shoe Light Vessel c		

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923.]

Station.	Call signal.	Station controlled by—
Berkeley, Calif.	6ZAZ	C. W. Stefan and C. H. Rosenzider, 1615 Arch Street.
Bozeman, Mont.	7XBC	H. B. Cutting, 420 West Koch Street.
Brookline, Mass.	1ZO	Robert P. Siskind, 1136 Beacon Street.
Butte, Mont.	7XBA	Abner R. Wilson, 1821 West Platinum Street.
Do.	7XBB	F. F. Gray, 2309 Richardson Street.
Cranford, N. J.	2XV	Radio Corporation of America, 16 Johnson Avenue.
Dover, Ohio.	8XBF	Henry J. Partridge, 135 Broadway.
East Pittsburgh, Pa.	8ZM	Edward B. Landon, 139 Avenue F.
Fresno, Calif.	6ZJ	Carlos S. Mundt, 1501 Palm Avenue.
Hartford, Conn.	1XAQ	S. Kruse, 18 Rodney Street.
Kalamazoo, Mich.	8XF	Kalamazoo Colleges.
Lansing, Mich.	8ZR	Roy R. Palmer, 331 North Pennsylvania Street.
Little Rock, Ark. (portable)	5XAR	O. L. Carrington, 1415 Barker Avenue.
Los Angeles, Calif.	6XO	Westinghouse Electric & Manufacturing Co., 428 South San Pedro Street.
Los Gatos, Calif.	6ZAH	Burton R. Cole, 16 Ellenwood Street.
Do.	6ZAR	Charles C. Whynall, Hermosday Street.
Medford, Oreg.	7XAC	W. J. Virgin.
New York, N. Y.	2XW	Radio Corporation of America, 458 West End Avenue.
Oakland, Calif.	6ZAP	James F. Brown, 295 Perkins Street.
Do.	6ZAF	Ray H. Cornell, 3923 Whitney Street.
Pasco, Wash.	7ZX	Loren C. Maybee, 110 South Seventh Street.
Paterson, N. J.	2ZA	George O. Milne, 142 Totowa Road.
Portland, Oreg.	7XAD	Benson Technical School Student Body.
Rye, N. Y.	2XH	Radio Corporation of America, 276 Purchase Street.
San Francisco, Calif.	6ZAQ	Charles A. Gaul, 15 Hoffman Avenue.
Schenectady, N. Y. (portable)	2XAZ	General Electric Co.
Walla Walla, Wash.	7XAB	Frank A. Moore, 707 Baker Building.

Special land stations, grouped by districts.

Call signal.	District and station.
	First district:
1XAQ	Hartford, Conn.
1ZO	Brookline, Mass.
	Second district:
2XAZ	Schenectady, N. Y. (portable).
2XH	Rye, N. Y.
2XV	Cranford, N. J.
2XW	New York, N. Y.
2ZA	Paterson, N. J.
5XAR	Fifth district: Little Rock, Ark. (portable).
	Sixth district:
6XO	Los Angeles, Calif.
6ZAE	Berkeley, Calif.
6ZAF	Oakland, Calif.
6ZAH	Los Gatos, Calif.
6ZAP	Oakland, Calif.
	Sixth district—Continued.
6ZAQ	San Francisco, Calif.
6ZAR	Los Gatos, Calif.
6ZJ	Fresno, Calif.
	Seventh district:
7XAB	Walla Walla, Wash.
7XAC	Medford, Oreg.
7XAD	Portland, Oreg.
7XBA	Butte, Mont.
7XBB	Do.
7XBC	Bozeman, Mont.
7ZX	Pasco, Wash.
	Eighth district:
8XBF	Dover, Ohio.
8XF	Kalamazoo, Mich.
8ZM	East Pittsburgh, Pa.
8ZR	Lansing, Mich.

ALTERATIONS AND CORRECTIONS.

[illegible]

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BOLINAS, CALIF. (KPH).—Add this note: Remotely controlled from San Francisco, Calif.

CLEARWATER, CALIF. (KNR).—W. l., 3320, 3765, 9600.

CLEVELAND, OHIO (WTK).—Loc. (approximately) 0.81° 41′ 30″, N. 41° 30′ 00″; w. l., add 1800.

LOS ANGELES, CALIF. (KWH).—W. l., 143.

NEW YORK, N. Y. (KUVS).—W. l., 300, 450, 600.

SAN FRANCISCO, CALIF. (KPH).—Add to list with this note: *See* Bolinas, Calif., for particulars.

Strike out all particulars of the following-named stations: Butte, Mont.; Jordan, Mont.; Miles City, Mont.; Princeton, Ind.; Rainbow, Mont. (near Great Falls); Sisseconset, Mass.; and Thompson Falls, Mont.

COMMERCIAL SHIP STATIONS ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

A. C. BEDFORD.—W. I., add 706.
ADMIRAL GOODRICH.—Name changed to Koyo; National Steamship Co. owner of vessel.
AGWIDALE.—System, Navy-R. C. A., 1000; w. l., 300, *600*.
AGWILAKE.—W. I., add 706.
AGWISEA.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, *600*.
AGWISMITH.—W. I., add 706.
AGWIWORLD.—W. I., add 450.
ALA.—W. I., add 706.
ALABAMA (WRAE).—W. I., 300, 450, *600*, 706.
ALBERT E. WATTS.—W. I., add 706.
ALGIC.—System, Navy-R. C. A., 1000; w. l., add 706.
AMERICA.—W. I., add 450.
AMERICAN LEGION.—Station operated and controlled by I. W. T. Co.
ANTIETAM.—W. I., add 706.
AQUARIUS.—Station operated and controlled by S. O. R. S.
ASHBRE.—New York Shipbuilding Corp. owner of vessel.
BANTU.—W. I., add 706.
BEARPORT.—System, Navy-R. C. A., 1000; w. l., 300, 450, *600*, 706.
BENJ. F. PACKARD.—W. I., 300, 450, *600*.
BIRMINGHAM CITY.—W. I., add 706.
BLAIR.—Station operated and controlled by S. O. R. S.
BREMERTON.—W. I., add 706.
BROOKINGS.—W. I., add 706.
BRUSH.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, *600*, 706.
CALAMARES.—W. I., add 706.
CANANOVA.—W. I., add 706.
CAPE COD.—W. I., add 706.
CAPILLO.—W. I., add 706.
CARPLAKA.—Station operated and controlled by S. O. R. S.
CASCADE (KDIS).—Station operated and controlled by owner of vessel.
C. A. SNIDER.—W. I., add 706.
CATHERINE.—W. I., 300, 450, *600*, 706; home, N.
CATHERINE, G. SUDDEN.—Range, 200; system, Gray & Danielson, 240; w. l., 300, *600*; rates, 8 cents per word; station operated and controlled by owner of vessel.
CETHANA.—Pacific Motorship Co., owner of vessel.
CHARLES E. HARWOOD.—System, R. C. A., 1000; w. l., add 706.
CHATTANOOGA CITY.—W. I., add 706.
CITY OF EVERETT.—System, Cutting & Washington, 1000; w. l., 300, *600*, 706; station operated and controlled by I. W. T. Co.
CITY OF FAIRBURY.—Station operated and controlled by S. O. R. S.
CITY OF LOS ANGELES.—Los Angeles Steamship Co., owner of vessel.
CITY OF WEATHERFORD.—Station operated and controlled by S. O. R. S.
CLEARWATER.—Station operated and controlled by S. O. R. S.
CLEMENCE C. MORSE.—Station operated and controlled by S. O. R. S.
COASTWISE.—W. I., add 706.
COLDBROOK.—Station operated and controlled by S. O. R. S.
COLD HARBOR.—W. I., add 706.
COLORADO SPRINGS.—Station operated and controlled by S. O. R. S.
COMAL.—System, R. C. A., 1000; w. l., add 450.
CONNEAUT.—System, R. C. A., 1000; Wyandotte Transportation Co., owner of vessel.
CORNELIA.—System, Navy-R. C. A., 1000; w. l., 300, 450, *600*, 706.
CORNING.—System, R. C. A., 1000; w. l., add 706.
CORSON.—W. I., add 706.
CUSHNET.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, *600*.
DELROSA.—W. I., add 706.
DEVOLENTE.—Name changed to Beaconoil; system, Navy-Liberty, 1000; w. l., add 706; station operated and controlled by R. C. A.
DOYLESTOWN.—W. I., add 450.
EASTERNER.—W. I., add 706.
EASTERN LEADER.—W. I., add 706.

EASTERN PILOT.—W. l., add 706.
EASTERN SUN.—W. l., add 706.
EAST WIND.—W. l., add 706.
EDGAR BOWLING.—W. l., add 706.
EDGEFIELD.—Station operated and controlled by I. W. T. Co. (U. S. L.).
EDITH.—W. l., 300, 450, 600, 706.
EFFNA.—Station operated and controlled by S. O. R. S.
EGREMONT.—W. l., add 706.
EL ALMIRANTE.—W. l., 300, 600, 706.
EL CAPITAN (WNB).—W. l., add 706.
ELKRIDGE.—W. l., add 706.
EMORY L. FORD.—Range, 150; system, Simon, 1000; w. l., 300, 600, 706; rates, Great Lakes service, 2 cents per word; station operated and controlled by owner of vessel.
EMPIRE.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 600, 706; rates, 8 cents per word; station operated and controlled by I. W. T. Co.
EVERGREEN CITY.—Station operated and controlled by S. O. R. S.
FAIRFIELD CITY.—W. l., add 706.
FRANKLIN K. LANE.—System, R. C. A., 1000.
FRED G. HARTWELL.—Range, 150; system, Navy-Simon, 1000; w. l., 300, 600, 706; rates, Great Lakes service, 2 cents per word; station operated and controlled by owner of vessel.
HAGOOD.—W. l., add 706.
HAMILTON.—Old Dominion Steamship Co. owner of vessel.
HATTERAS.—W. l., add 706; station operated and controlled by S. O. R. S.
HAYMON.—Range, 300; system, Federal arc; w. l., 300, 600, 1800.
HENRY CLAY.—Range, 300; system, R. C. A., 1000; w. l., 300, 600.
HENRY M. FLAGLER.—W. l., add 450.
HICKMAN.—W. l., add 706.
HIGHO.—Station operated and controlled by S. O. R. S.
HOVEN.—Station operated and controlled by I. W. T. Co. (U. S. L.).
HOWICK HALL.—W. l., add 706.
HULACO.—System, Navy-Lowenstein, 1000; station operated and controlled by Federal Telegraph Co.
HUMBOLDT.—James K. Nelson owner of vessel.
ILLINOIS (KDSZ).—W. l., add 706.
INVINCIBLE.—Station operated and controlled by S. O. R. S.
JEFFERSON (KOD).—Old Dominion Steamship Co. owner of vessel.
JIM SID.—W. l., 300, 450, 600; rates, 3 cents per word; station operated and controlled by owner of vessel.
JOHN D. ARCHBOLD.—W. l., add 450.
JOHN F. HYLAN.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600.
JOHN JAY.—Range, 300; system, Federal arc; w. l., 300, 600.
JOMAR.—W. l., add 450.
JOSIAH MACY.—System, R. C. A., 1000; w. l., 300,450, 600, 706.
KAMERIT.—Station operated and controlled by S. O. R. S.
KATHERINE DONOVAN.—Donovan Lumber Co. owner of vessel.
LAKE CLEAR.—Construction Materials Co. owner of vessel.
LAKE FARLIN.—Range, 200; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.
LAKE FLATONIA.—Range, 200; system, Navy-R. C. A., 1000; w. l., 300, 600.
LAKE GANDO.—Range, 200; system, R. C. A., 1000; w. l., 300, 450, 600.
LAKE GEORGE.—Davidson Steamship Co. owner of vessel.
LAKE WEIR.—System, Navy-Simon, 1000; Construction Materials Co. owner of vessel.
LEBEC.—System, Federal arc, 1000 with chopper; w. l., add 706.
LENAPE.—System, R. C. A., 1000; w. l., add 450.
LORRAINE CROSS.—Station operated and controlled by S. O. R. S.
MAVINCOCK.—W. l., 300, 450, 600, 706.
M. F. ELLIOTT.—W. l., add 450.
MITCHELL.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 600.
MONUS.—System, R. C. A., 1000; w. l., add 450.
MOUNT CARROLL.—System, Telefunken, 1000; beam, X.
MUNCOVE.—W. l., add 706.
MUNSOMO.—W. l., add 706.
MUSKOGEE.—W. l., add 706.
NABESNA.—W. l., 300, 600, 706.
NEMAHA.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 600.

NOBLES.—W. l., add 706.
ORCUS.—W. l., add 706.
ORLEANS.—System, Navy-R. C. A., 1000.
OSSINING.—W. l., add 706.
PANSA.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, 600.
PARIA.—System, Navy-Wireless Improvement Co., 1000; w. l., add 706.
PERE MARQUETTE.—System, R. C. A., 1000.
POINT LOMA.—Hart-Wood Lumber Co., owner of vessel.
POLYBIUS.—System, Navy-Liberty, 1000; w. l., 300, 450, 600, 706; hours, X; station operated and controlled by I. W. T. Co. (U. S. L.).
PRESIDENT FILLMORE.—Station operated and controlled by I. W. T. Co.
PRESIDENT LINCOLN.—Station operated and controlled by R. C. A.
PRESIDENT MADISON.—Station operated and controlled by R. C. A.
PRESIDENT MONROE.—Station operated and controlled by I. W. T. Co.
PRESIDENT ROOSEVELT.—Station operated and controlled by I. W. T. Co.
RELIEF.—Range, 150; w. l., 300, 450, 600, 706; rates, 8 cents per word.
REPUBLIC (WSU).—W. l., add 706.
RESOLUTE (KRM).—W. l., add 706.
ROBIN GRAY.—W. l., add 706.
RUSHVILLE.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600.
SAC CITY.—W. l., add 706.
SACO.—System, Navy-Wireless Specialty Apparatus Co., 1000.
SAMUEL L. FULLER.—W. l., 300, 450, 600, 706.
SAN JOSE.—W. l., add 706.
SERANDEEE.—Range, 150.
SEVERANCE.—W. l., add 706.
SOCONY 84.—W. l., add 706.
SOUTHERN CROSS.—Station operated and controlled by I. W. T. Co.
STEEL INVENTOR.—W. l., add 450.
STEEL RANGER.—W. l., add 706.
STEEL SCIENTIST.—W. l., add 706.
STEEL TRADER.—W. l., add 706.
SUDAWSONGO.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., add 706.
SUEDCO.—W. l., add 706.
SUJERSEYOO.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600, 706.
SUNANCO.—W. l., add 706.
SURFMICO.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600, 706.
SUTRAYSCO.—W. l., add 706.
SUWARINCO.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600, 706.
SWIFT ARROW.—System, Cutting & Washington, 1000; w. l., add 706.
THOMAS CROWLEY.—Range, 200; system, Navy-Simon, 1000; w. l., 300, 450, 600, 706; rates, 8 cents per word.
TORRES.—System, R. C. A., 1000; w. l., 300, 600.
TRIPP.—Station operated and controlled by S. O. R. S.
TULSAGAS.—W. l., add 706.
TUSCALOOSA CITY.—W. l., add 450.
TUXPANOIL.—W. l., add 706.
VESTA.—W. l., add 706.
VICTORIOUS.—Station operated and controlled by S. O. R. S.
VIRGINIA.—System, R. C. A., 1000; Texas S. S. Co., owner of vessel.
WASHINGTON.—Walters Navigation Corp., owner of vessel.
WELLINGTON.—W. l., add 706.
WEST CAMARGO.—W. l., add 706.
WEST CANON.—Station operated and controlled by S. O. R. S. (U. S. L.).
WEST CATANACH.—Name changed to Atlantic; Edgerton Parsons owner of vessel.
WEST CHESWALD.—W. l., add 706.
WESTERN OCEAN.—System, Navy-Kilbourne, 1000; w. l., 300, 450, 600, 706; hours, X.
WEST HENSHAW.—Range, 300; w. l., 300, 600, 706.
WEST IRA.—Station operated and controlled by S. O. R. S.
WEST KEENE.—System, Navy-Lowenstein, 1000.
WEST LOQUASSUCK.—W. l., add 706.
WEST NILUS.—System, Navy-Kilbourne & Clark, 1000; w. l., add 706; station operated and controlled by R. C. A. (U. S. L.).
WEST TACOOK.—Station operated and controlled by S. O. R. S.

WEST TOHANT.—Station operated and controlled by S. O. R. S.
WHEATLAND MONTANA.—W. L., add 706.
WILLIAM PERKINS.—W. L., add 706.
WILLIAM BOYCE THOMPSON.—W. L., add 706.
W. S. REEBE.—W. L., add 706.
YANKEE ARROW.—Range, 300; system, R. C. A., 1000; w. l., 300, 450, 600, 706.
Strike out all particulars of the following-named vessels: Alpha, Calhabama, City of Everett, City of Rockland, Henry J. Biddle, Mary, Polillo, and Tamesi.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KEE, *read* Atlantic; KIVR, *read* Beaconcol; KPH, *read* Bolinas, Calif. (remotely controlled from San Francisco, Calif.); WRJ, *read* Noyo; strike out all particulars following the call signals, KDVB, KDWO, KLL, KLQ, KMN, KRI, KTOE, KTQ, KUVR, KUXN, WJAV, WOW, WPUI, WSC, and WTB.

COMMERCIAL AIRPLANE STATIONS ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BUCKEYE.—Strike out all particulars.

BROADCASTING STATIONS, BY CALL SIGNALS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923.]

KFAY (Medford, Oreg.).—Power, 50; w. l., 283, frequency, kc. 1060.
KFCK (Colorado Springs, Colo.).—W. l., 258, frequency, kc. 1160.
KFCY (Le Mars, Iowa).—Power, 50; w. l., 252, frequency, kc. 1190.
KFGQ (Boone, Iowa).—Power, 10.
KFHA (Gunnison, Colo.).—W. l., 252, frequency, kc. 1190; station operated and controlled by Western State College of Colorado.
KFHD (St. Joseph, Mo.).—Power, 100.
KFIX (Independence, Mo.).—Power, 250.
KFJK (Bristow, Okla.).—Frequency, kc. 1290.
KFLE (Denver, Colo.).—Power, 25.
KMJ (Fresno, Calif.).—W. l., 273, frequency, kc. 1100.
KYW (Chicago, Ill.).—Power, 1000; w. l., 536, frequency, kc. 560.
WABH (Sandusky, Ohio).—Power, 20.
WABO (Rochester, N. Y.).—Power, 10.
WBAH (Minneapolis, Minn.).—W. l., 417, frequency, kc. 720.
WBAP (Fort Worth, Tex.).—Power, 750.
WDAY (Fargo, N. Dak.).—Station operated and controlled by Radio Equipment Corp.
WEAH (Wichita, Kans.).—Power, 50; station operated and controlled by Wichita Board of Trade.
WEV (Houston, Tex.).—Power, 50.
WFAH (Port Arthur, Tex.).—W. l., 236, frequency, kc. 1270.
WFAV (Lincoln, Nebr.).—Power, 500; w. l., 275, frequency, kc. 1090.
WGAZ (South Bend, Ind.).—Power, 50.
WGR (Buffalo, N. Y.).—W. l., 319; frequency, kc. 940.
WHAR (Atlantic City, N. J.).—Power, 10.
WIAD (Ocean City, N. J.).—Station operated and controlled by Howard R. Miller, 6318 Park Avenue.
WIAH (Newton, Iowa).—W. l., 258, frequency, kc. 1160.
WIAO (Milwaukee, Wis.).—Power, 100.
WIL (Washington, D. C.).—Power, 10.
WKAR (East Lansing, Mich.).—Power, 250.
WKAV (Laconia, N. H.).—W. l., 254, frequency, kc. 1180.
WKAY (Gainesville, Ga.).—Power, 10; w. l., 280, frequency, kc. 1070.
WLAV (Pensacola, Fla.).—Power, 15, w. l., 254, frequency, kc. 1180.
WMAF (Dartmouth, Mass.).—Power, 100-500.
WMAL (Trenton, N. J.).—Power, 50.
WMAQ (Chicago, Ill.).—Power, 250.
WNAC (Boston, Mass.).—W. l., 278, frequency, kc. 1080.
WNAP (Springfield, Ohio).—W. l., 231, frequency, kc. 1300.

WNAQ (Charleston, S. C.).—Power, 10.
WNAT (Philadelphia, Pa.).—Power, 100.
WNAV (Knoxville, Tenn.).—W. L., 236, frequency, kc. 1270.
WOAC (Lima, Ohio).—Power, 50.
WOAF (Tyler, Tex.).—Power, 10.
WOAP (Kalamazoo, Mich.).—W. L., 240, frequency, kc. 1250.
WQAK (Dubuque, Iowa).—Power, 100; w. l., 268, frequency, kc. 1120.
WQAN (Scranton, Pa.).—Power, 100.
WQAQ (Abilene, Tex.).—Station operated and controlled by West Texas Radio Co. (Abilene Daily Reporter).
WRAN (Waterloo, Iowa).—Power, 10; w. l., 236, frequency, kc. 1270.
WRAY (Scranton, Pa.).—Power, 100.
WRW (Tarrytown, N. Y.).—Power, 150.
WSAD (Providence, R. I.).—Power, 100.
WSAT (Plainview, Tex.).—Station operated and controlled by Donohoe-Ware Hardware Co.
WSAW (Canandaigua, N. Y.).—Station operated and controlled by John J. Long, jr.
WTAD (Carthage, Ill.).—Power, 10.
WTAR (Norfolk, Va.).—Power, 100; w. l., 280, frequency, kc. 1070.
WTAW (College Station, Tex.).—W. L., 280, frequency, kc. 1070.
Strike out all particulars of the following-named stations: KFGY, Beardette, Minn.; KFHI, Wichita, Kans.; KFHY, Trinidad, Colo.; KFJQ, Grand Forks, N. Dak. (portable); WAAP, Wichita, Kans.; WBAF, Moorestown, N. J.; WEAK, St. Joseph, Mo.; WGF, Des Moines, Iowa; WHAO, Savannah, Ga.; WIAY, Washington, D. C.; WMAM, Beaumont, Tex.; WOAB, Grand Forks, N. Dak.; WOAR, Kenosha, Wis.; WPAF, Council Bluffs, Iowa; WQAK, Dubuque, Iowa; WRAR, David City, Nebr.; WRAS, McLeansboro, Ill.; and WSAU, Chesham, N. H.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AMBROSE CHANNEL LIGHT VESSEL.—Loc. 0.73° 50′ 02″, N. 40° 27′ 59″.
BLUNTS REEF LIGHT VESSEL.—Loc. 0.124° 20′ 14″, N. 48° 29′ 04″.
BRUNSWICK LIGHT VESSEL.—Loc. 0.81° 09′ 29″, N. 31° 00′ 19″.
CAPE CHARLES LIGHT VESSEL.—Loc. 0.75° 41′ 00″, N. 37° 04′ 55″.
CAPE LOOKOUT SHOALS LIGHT VESSEL.—Loc. 0.76° 34′ 18″, N. 34° 18′ 27″.
CORNFIELD POINT LIGHT VESSEL.—Loc. 0.72° 22′ 15″, N. 41° 12′ 38″.
DIAMOND SHOALS LIGHT VESSEL.—Loc. 0.75° 19′ 44″, N. 35° 05′ 18″.
FENWICK ISLAND SHOAL LIGHT VESSEL.—Loc. 0.74° 45′ 52″, N. 38° 29′ 10″.
FIVE FATHOM BANK LIGHT VESSEL.—Loc. 0.74° 34′ 33″, N. 39° 47′ 37″.
FRYING PAN SHOALS LIGHT VESSEL.—Loc. 0.77° 43′ 49″, N. 33° 34′ 04″.
GRAND MARIAN, MICH.—Correct orthography Grand Marais, Mich.
HEALD BANK LIGHT VESSEL.—Loc. 0.94° 12′ 27″, N. 29° 00′ 05″.
NORFOLK, VA.—W. L., add 507 and 1395, v. t. c. w.
NORTH EAST END LIGHT VESSEL.—Loc. 0.74° 29′ 34″, N. 38° 57′ 45″.
SAN JUAN, P. R.—W. L., 400, 2400, 2750, spark and 2850, 4650, 6575, 9165, 10110, arc.
SWIFTSURE BANK LIGHT VESSEL.—Loc. 0.125° 00′ 00″, N. 48° 31′ 44″.
UMATILLA REEF LIGHT VESSEL.—Loc. 0.124° 59′ 26″, N. 46° 19′ 02″.
WINTER QUARTER SHOALS LIGHT VESSEL.—Loc. 0.74° 50′ 22″, N. 37° 16′ 25″.

Strike out all particulars of the following-named stations: Fort Crockett, Tex.; Fort San Jacinto, Tex.; Fort Travis, Tex.; Memphis, Tenn.; New Orleans, La. (WYDC); and St. Louis, Mo.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Strike out all particulars of the following-named vessels: Apo, Baton Rouge, Cairo, Celtic, Choctaw, Curacao, Fortune, Georgia, Housatonic, Machias, Mars, Memphis (WYDJ), Monadnock, Natchez, Nebraska, New Orleans (WYDH), Nokomis, Osceola, Panther, Prairie, Quiros, Rhode Island, S. C. 108, St. Louis, Vicksburg (WYDE), Vixen, and Vulcan.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NZT, read Grand Marais, Mich.; strike out all particulars following the call signals, NAGQ, NDB, NEGS, NFX, NGF, NHD, NJR, NMA, NOA, NOGQ, NOJ, NQL, NQM, NQZ, NSU, NTX, NUDP, NVT, WUX, WUY, WXP, WYDA, WYDB, WYDC, WYDD, WYDE, WYDF, WYDG, WYDH, WYDI, WYDJ, WYDK, and WYDL.

GOVERNMENT AIRSHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ZR-1.—Name changed to Shenandoah.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923.]

BALTIMORE, MD. (3XX).—Station operated and controlled by R. Selway Collinus and William E. Lehr, 3912 Maine Avenue.
BROOKLINE, MASS. (1XA).—Changed to Andover, Mass.
CONWAY, ARK. (5XAC).—Station operated and controlled by Ben H. Woodruff.
DARTMOUTH, MASS. (1XAN).—This is a portable station.
NEW BRAUNFELS, TEX. (5YK).—Station operated and controlled by New Braunfels High School.
REDDLEY, CALIF. (6XAV).—Changed to Hollywood, Calif., 7058½ Hollywood Boulevard.
STAPLETON, N. Y. (2XAC).—Station operated and controlled by J. B. Ferguson, 29 Broadway, New York, N. Y.
TUCSON, ARIZ. (6XAZ).—Station operated and controlled by L. R. Wilson.
WACO, TEX. (5ZAF).—Station operated and controlled by William P. Clarke, 728 North 13th Street.
Strike out all particulars of the following-named stations: Agricultural College, N. Dak. (9YG); Atlanta, Ga. (4XC); Atlanta, Ga. (4XN); Atlanta, Ga. (4YA); Atlanta, Ga. (4YD); Chicago, Ill. (9XU); College Park, Ga. (4XO); Colorado Springs, Colo. (9XC); El Dorado, Kans. (9XP); Eugene, Oreg. (7YB); Fulton, Mo. (9YR); Hoboken, N. J. (2XD); Iowa City, Iowa (9YA); Kansas City, Mo. (9XK); Morgantown, W. Va. (8YH); Pawtucket, R. I. (1XAD); Pittsburgh, Pa. (8YZ); Pullman, Wash. (7ZS); Raleigh, N. C. (4YC); Salt Lake City, Utah (6ZV); St. Louis, Mo. (9XR); Tampa, Fla. (4XJ); and White Sulphur Springs, W. Va. (8XP).

MISCELLANEOUS.

TIME SIGNALS IN FOREIGN COUNTRIES.

Germany.—Nauen now sends a time signal on 3,100 meters and simultaneously on a wave length of 13,000 meters.

Russia.—Petrograd sends a signal on 1,500 meters, spark. Moscow transmits a signal on 5,000 meters, spark.

NEW LISTS OF STATIONS NOW AVAILABLE.

The new list of Commercial and Government Radio Stations of the United States, edition June 30, 1923, which contains a list of the broadcasting stations and the list of Amateur Radio Stations of the United States, edition June 30, 1923, can now be purchased from the Superintendent of Documents, Government Printing Office, this city. The price of the first-named list is 15 cents per copy and the price of the last-named list is 25 cents per copy. Do not send remittances to the Bureau of Navigation.

NEW RADIO FOG SIGNALS.

The following-named radio fog signals have been placed in operation by the United States Lighthouse Service:

[1] Boston Light Vessel (NADX) (lat. 42° 20′ 22″ N., long. 70° 45′ 26″ W.)—

Group of one dash and one dot for	15 seconds.
Silent	15 seconds.

Nantucket Shoals Light Vessel (NLA) (lat. 40° 3″ 02″ N., long. 69° 57′ 06″ W.)—

Groups of four dashes for	30 seconds.
Silent	25 seconds.

Columbia River Light Vessel (NAJT) (lat. 46° 16′ 45″ N., long. 124° 10′ 35″ W.)—

Groups of three dashes for	30 seconds.
Silent	30 seconds.

Swiftsure Bank Light Vessel (NABT) (lat. 48° 31′ 44″ N., long. 125° 00′ 00″ W.)—

Groups of two dashes for	35 seconds.
Silent	25 seconds.

The signals are transmitted continuously during thick or foggy weather on a wave length of 1,000 meters.

For list of stations in addition to the above see the list of Commercial and Government Radio Stations of the United States, edition June 30, 1923.

RADIO FOG SIGNALS ESTABLISHED IN NORWAY

A radio fog signal has been established at Marstenen Light Station, west coast of Norway, in (approximately) 60° 0′ 45″ N., 5° 01′ 00″ E. The signal consists of the call signal of the station TNY repeated three times, followed by a series of V's for 50 seconds. The above system is issued three times, followed by an interval of 1 minute. The range is about 30 miles. The fog signal is automatic and operates on a wave length of [illegible] meters.

Another fog signal has been established at Feeder Light Station in (approximately) 59° 0′ [illegible] N., 11° 31′ 34″ E. The signal consists of the call signal TKW repeated three times, followed by a series of V's for 50 seconds. The above system is issued three times, followed by an interval of [illegible] minute. The range is about 30 miles. The signal is automatic and is sent on a 1,000-meter wave length.—*From Notes to Mariners, No. 41, 1923.*

FOG SIGNAL ESTABLISHED IN GULF OF ST. LAWRENCE

An automatic radio fog signal has been established on the Anticosti Light Vessel located in 22 fathoms, 4 miles 104° from Heath Point. The station will transmit on a wave length of [illegible] meters with a spark frequency of 500. The characteristic of the station will be a series of groups of four dashes transmitted for a period of 60 seconds, followed by an interval of 4 minutes. The elapsed time from the beginning of one group of dashes to the beginning of the next group will be 4 seconds.

In foggy weather the automatic transmitter will be in operation on 1,000 meters continuously except when the operator is on watch. The operator will maintain watch on 600 meters during the following hours, eastern standard time: 7–7.30 a. m., 9–9.30 a. m., 11–11.30 a. m., 1–1.30 p. m., 3–3.30 p. m., 5–5.30 p. m., 7–7.30 p. m., and 10–10.30 p. m.

If during the period in which the operator is on watch a ship should require the light vessel to transmit radio signals for direction-finding purposes, the request for such signals should be made on 600 meters. The light vessel will then acknowledge the request on that wave length, after which she will immediately transmit the automatic radio beacon signal on 1,000 meters. No charge is made for this service. The transmitting range is about 30 miles. Location, approximately: 49° 03′ 00″ N., 61° 30′ 30″ W.

Masters of vessels equipped to receive these signals are requested to listen in when in the vicinity of this station and report the results of such reception to the Radio Inspector, H. M. C. Dockyard, Halifax, Nova Scotia, or to Radio Inspector, Marine Department, Old Customs Building, Montreal, Quebec, or directly to the Director of Radio, Department of Marine and Fisheries, Ottawa, Canada.—*From Notes to Mariners, No. 42, 1923.*

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[1] Equipped only with radio fog signal, no other apparatus.

IMPROVISED SET USED IN EMERGENCY ON THE "HARRY LUCKENBACH."

On a recent voyage of the steamship Cuba the motor generator used to operate the radio set became inoperative, and because of this defect, which the radio operators and the ship's electrician were unable to remedy, the vessel could not transmit radio signals and obtain compass bearings, which probably would have saved the vessel.

In a similar case the resourcefulness of the operators of the steamship *Harry Luckenbach* is to be commended. The operators contrived an apparatus for interrupting the direct current by taking an ordinary electric fan and providing brushes for the same, which were placed in the direct-current circuit. In this way they were able to work distances up to 1,400 miles. The blades of the fan acted as a motor and made contact with the improvised brushes, thus giving a pulsating current through the transformer. This improvised emergency set made it possible to carry on radio communication and is brought to the attention of other radio operators who may in the future have similar experiences.

Details of time, weather, press, and hydrographic bulletin schedules transmitted by naval radio stations.

Name of station	Call signal	Wave length	Type of station	Time (24-hr. system).	Nature of service
Annapolis, Md	NSS	[illegible]	arc	55	Time.
				1700	Ice report
				2155	Time, press
Arlington, Va	NAA	3,000	arc	1000	Weather, hydrographic
		2,655	[illegible]	1155	Time, weather, warnings
				2155	Time, weather, hydrographic, press.
Balboa, C. Z.	NBA	7,000	arc	0000	Time, press
				0155	Time
Bar Harbor, Me	NRD	2,400	[illegible]	0200	Press
Boston, Mass	NAD	1,300	[illegible]	1000	Weather, hydrographic
				1155	Time, if Arlington fails
				1700	Weather, hydrographic.
Brownsville, Tex	NAT	2,300	spark	[illegible]	Weather
				1200	Do.
				1400	Do.
Cavite, P. I.	NPO	1,200	arc	[illegible]	Time, weather, hydrographic.
				[illegible]	Do
		2,700	spark.	[illegible]	Do.
				[illegible]	Do
Charleston, S. C	NAO	2,000	spark	1000	Weather, hydrographic
				1155	Time, if Arlington fails
				1900	Weather, hydrographic
Colon, C. Z.	NAX	1,400	spark	0155	Time, hydrographic, press.
				1255	Do
Dutch Harbor, Alaska.	NPR	2,200	spark	0800	Weather
				1200	Do.
				1900	Do.
Eureka, Calif.	NPW	2,200	spark	1155	Time
				1700	Weather
				2000	Do
Galveston, Tex	NEB	1,317	spark	1130	Weather, hydrographic.
				1900	Do.
Great Lakes, Ill.	NAJ	4,000	arc	1045	Hydrographic.
				1700	Do
		3,000	spark	[illegible]	Weather
				1100	Hydrographic
				1155	Time
				1715	Hydrographic
				[illegible]	Weather
Guantanamo, Cuba.	NAW	2,700	spark	[illegible]	Hurricane warning as issued every [illegible] hours.
		[illegible]	arc	[illegible]	
Honolulu, Hawaii	NPM	2,200	spark	0130	Weather, hydrographic.
				1330	Do
				1730	Do.
				1955	Time.
				1955	Do.
Inglewood, Calif.	NPX	12,000	arc	1100	Weather.
		1,435	spark	1700	Do.
				2330	Do.
Jupiter, Fla	NAQ	1,300	spark.	1155	Do.
				1555	Do.
Key West, Fla	NAR	2,700	[illegible]	1155	Time.
				[illegible]	Time, press, weather
		4,000	arc.	[illegible]	Weather

Details of time, weather, press, and hydrographic bulletin schedules transmitted by naval radio stations—Continued.

Name of station.	Call signal.	Wave length	Type of station.	Time (75th meridian)	Nature of service
New Orleans, La	NAT	2,600	spark.	1105	Weather, hydrographic.
				1155	Time.
				1700	Weather, hydrographic.
				1800	Weather.
				2000	Do.
Newport, R. I	NAP	2,600	spark	1440	Time if Arlington fails.
New York, N. Y	NAH	[illegible]	[illegible]	1105	Weather, hydrographic
				1455	Time, if Arlington fails
				1705	Weather, hydrographic.
Norfolk, Va	NAM	[illegible]	spark	0530	Weather
				1045	Weather hydrographic.
				1145	Time, if Arlington fails.
				1600	Weather, hydrographic
				2000	Weather
		1,200	spark	2030	Do.
		607	[illegible]	2300	Do
North Head, Wash	NPH	2,725	spark	0430	Do.
				0600	Do.
				1030	Do.
				1445	Time.
				1600	Weather, hydrographic.
				2000	Weather.
				2030	Weather hydrographic.
Pensacola, Fla.	NAS	1,200	[illegible]	45	Weather
				1900	Do.[1]
Philadelphia, Pa	NAI	1,200	[illegible]	7045	Weather hydrographic
				1700	Do
Port au Prince, Haiti.	NSC	2,284	spark		Hurricane warnings as issued every four hours
Portland, Me	NAB	600	spark	1200	Weather
				2100	Do.
Puget Sound, Wash	NPC	1,400	spark.	0900	Do
				1300	Weather, hydrographic
				1600	Do.
				2000	Do
				2200	Hydrographic
				2300	Weather
San Diego, Calif.	NPL	2,000	arc	0400	Press
				1445	Time
		1,500	[illegible]	1455	Do.
San Francisco, Calif	NPG	[illegible]	arc.	0055	Do.
				0415	Press
				1200	Weather, hydrographic.
				1445	Time
		[illegible]	[illegible]	0055	Do.
				0100	Weather.
				0415	Press.
				1455	Time.
				2200	Weather, hydrographic
San Juan, P. R	NAU	[illegible]	arc	1700	Hurricane warnings
				2100	Weather.
Savannah, Ga	NEV	1,500	spark	1100	Do.
				1500	Do.[1]
St. Augustine, Fla.	NAF	2,100	spark	1100	Do.
				1500	Do.[1]
St. Croix, V. I.	NNI	400	spark		Hurricane warnings as issued every four hours
St. Thomas, V. I	NSD	1,400	spark		Do.
Tutuila, Samoa.	NPU	2,284	spark	0000	Weather, hydrographic
				1400	Do.
				2000	Do.

[1] Hurricane warnings as issued every two hours.

All naval time signals are made in a standard manner which is as follows:

The signal begins 5 minutes before the hour to be marked and consists of a dot for each second. The dot for the twenty-ninth second of each minute is omitted and also the last 5 seconds of the first 4 minutes. The last 10 seconds of the fifth minute are omitted, this silence being followed by a 1-second dash, the beginning of which marks the time signal.

ALASKAN STATIONS CLOSED UNTIL NEXT SEASON

The following-named stations closed until next season on the dates set after their names: Chomley (KQP), October 26; Hidden Inlet (KQL), October 1; Lazy Bay (KLPS), September 24; Port Althorp (KLW), October 3; Port Beauclaire (KWO), October 12; Port Walter (KEQ), October 13; Pybus Bay (KFC), September 26; Quadra (KHD), October 13; Rose Inlet (KJC), October 17; Tee Harbor (KQP), October 10; Union Bay (KUN), October 4; Uyak (KHA), September 20; Yakutat (KKA), October 12; Yes Bay (KRI), September 28.

REGULATIONS COVERING THE INSTALLATION OF RADIO TELEGRAPH AND TELEPHONE STATIONS IN GUATEMALA

The Government of Guatemala on September 27 last issued a decree regulating the operation of radio stations by individuals or companies.

REFERENCES TO CURRENT RADIO PERIODICAL LITERATURE

This is a monthly list of references prepared by the Radio Laboratory of the Bureau of Standards and is intended to cover the more important papers of interest to the professional radio engineer which have recently appeared in technical periodicals. The number at the left of each reference classifies the reference by subject in accordance with the scheme presented in A Decimal Classification of Radio Subjects: An Extension of the Dewey System, Circular No. 136, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. Further information about these lists, available uses of previous lists, and of the several periodicals is contained in the extended statement preceding the early lists as published in the Radio Service Bulletin prior to April, 1925, and also in May and September, 1923.

R000—Radio communication

R007.1 Cuban amateurs recognized by president. [illegible] (Regulations 20 meters and 5 kilowatts). Radio Digest [illegible] and 4, p. [illegible], October 4, 1925.

R007.5 British broadcasting [illegible] to be being at every [illegible] broadcasting station. Amateur Radio Journal, 2, p. 13, September 1, 1925.

R007.6 [illegible] Amateur Radio [illegible], 2, p. 5, [illegible] 1925.

R007.8 Radio activities: [illegible] Wireless Age, 11, pp. 41-42, October, 1925.

R000 A discussion of [illegible] (pamphlet). Published by [illegible] Leipzig, price 1 pence [illegible]. Noted in Wireless World and Radio Review, October 3, 1925.

R000 Mitchell, W. W. Time and weather by wireless. Published by the Wireless Press, Ltd., London, price 3s 6d. Noted in Wireless World and Radio Review, October 3, 1925.

R000 Superheterodyne receiver [illegible] Circular No. 3041, 40 p. Published by Experimenter's Information Service, New York, price 25 postpaid. Noted in Radio News, November, 1925.

R000 Radio News Amateur's Handbook. Experimenter Publishing Co., New York, price 25. Noted in Radio News, November, 1925.

R000 Badger, R. D. Wireless telephony. Published by Wireless Press (Ltd.), London, price 3s 6d. Noted in Wireless World and Radio Review, October 3, 1925.

R000 The dope on wave lengths and [illegible]. Radio Broadcast, 8, p. 47, November, 1925.

R000 Fox, F. E. How to convert wavelength into frequency. Popular Radio, 8, pp. 400-403, November, 1925.

R100—Radio principles

R110 Fleming, J. A. Electromagnetic waves, and wireless telephony and telegraphy. Radio News, 6, pp. 525-27, November, 1925.

R113.3 Ionization [illegible] radio during solar eclipse. Radio Broadcast, 8, p. 1, October, 1925.

R114 Austin, L. W. Observations on [illegible] Washington, March 1, 1923, to February 28, 1924. Proceedings Institute Radio Engineers, 13, pp. 459-485, October, 1925.

R120 Cornell, F. Radio activities de [illegible]. Wireless Age, 11, pp. 34-35, October, 1925.

R120 Jolliffe, H. Some experiments with loop antennas. Radio News of Canada, 1, pp. 35-38, October, 1925.

R120.1 Horton, J. R. Wireless direction finding at sea [illegible]. Journal Institution Electrical Engineers, 63, pp. [illegible], November, 1925.

R120 High power radio [illegible] for radiotelegraphy. A to 4 kilowatt triode [illegible]. Office [illegible], 13, pp. 11-17, August 4, 1925.

R120 Prince, D. C. [illegible] power amplifier circuit. Proceedings Institute Radio Engineers, 13, pp. 47-[illegible], October, 1925.

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STANDARD FREQUENCY STATIONS.

If every radio transmitting station maintained exactly the wave frequency assigned to it, there would be available a standard frequency wave every time any station was in operation. Data have not hitherto been available as to which, if any, stations

actually maintained a frequency sufficiently invariable to have as a standard. Unless special precautions are taken in a transmitting station, the wave is not likely to maintain a highly constant frequency. The mere use of the proper taps or settings on the tuning elements of the transmitting set is not sufficient. The effects of coupling, temperature, supply voltage, antenna conditions, and many other factors introduce variations into the frequency of the wave produced. It is necessary that a frequency indicator or wavemeter be used, and the set adjusted until the instrument shows positively that the wave has the proper frequency. This adjustment, furthermore, must be repeated or verified at intervals during the transmission. Measurements by the Bureau of Standards of the waves emitted by various stations show that stations which follow this practice maintain relatively constant frequency.

As a result of the bureau's measurements (reported in last month's RADIO SERVICE BULLETIN) it is possible to give from time to time data on stations which maintain a sufficient accuracy to be useful as frequency standards. Several of the broadcasting stations have very nearly attained the goal of remaining within 2 kilocycles of the assigned frequency, as recommended by the Second National Radio Conference (see issues in April, 1924, RADIO SERVICE BULLETIN).

It is possible at this time to give the data below on six broadcasting stations whose frequency is known by the bureau's measurements to maintain a relatively high constancy. These stations all have special means for maintaining constant frequency. The high-power low-frequency alternator stations have speed regulators. The broadcasting stations use frequency indicators (one-point wavemeters) and maintain a constant deflection of the frequency indicator throughout the transmission. The bureau has data on some other stations whose frequency is of about the same constancy, and these will probably be announced in next month's issue of the RADIO SERVICE BULLETIN.

The transmitted waves from these stations can be utilized for standardizing wavemeters and other apparatus by the procedure given in Bureau of Standards Letter Circular No. 92, Radio Signals of Standard Frequency and Their Utilization. A copy of this letter circular can be obtained by a person having actual use for it upon application to the Bureau of Standards, Washington, D. C.

Station.	Owner.	Location.	Assigned frequency (kc.).	Period covered by measurements.	Number of times measured.	Greatest deviation.	Average deviation.
WGY	R. C. A.	Ocean Hill, Long Island, N. Y.	[illegible]	Aug. 21–Oct. [illegible]	[illegible]	1.9	0.5
NAA	U. S. N.	Annapolis, Md.	[illegible]	do	30	.5	.3
WQK	R. C. A.	Rocky Point, Long Island, N. Y.	[illegible]	do	25	.4	.3
WJZ	do	Tuckerton, N. J.	[illegible]	do	38	.4	.1
WBO	do	Marion, Mass.	[illegible]	Aug. 21–Oct. [illegible]	37	.6	.2
WGY	G. E.	Schenectady, N. Y.	790	June–Oct.	34	.4	.2
KDKA	W. E. M.	East Pittsburg, Pa.	980	do	30	.4	[illegible]

R. C. A.—Radio Corporation of America.
U. S. N.—U. S. Navy.
G. E.—General Electric Co.
W. E. M.—Westinghouse Electric & Manufacturing Co.

SOURCES OF RADIO INFORMATION.

A considerable number of inquiries received at the radio laboratory of the Bureau of Standards call for the same kinds of elementary information regarding radio publications, radio laws and regulations, station and operators' licenses, and call books. In order to facilitate the handling of these inquiries, Bureau of Standards Circular No. 122 was prepared. The first edition has been revised. The new edition gives the more important periodicals of radio interest, lists the important Government radio publications and the radio books issued by various publishers which are of general interest, gives a brief summary statement regarding the radio laws and regulations of the United States and Canada, and gives a map showing the radio inspection districts. A copy of the second edition of Bureau of Standards Circular No. 122 may be purchased for 5 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

A METHOD OF MEASURING VERY SHORT RADIO WAVE LENGTHS AND THEIR USE IN FREQUENCY STANDARDIZATION.

A paper describing one method of establishing frequency standards employed by the Bureau of Standards has recently been published in the Proceedings of the Institute of Radio Engineers. The method described is based on the direct measurement in linear measure of the wave length of very short standing waves on a pair of parallel wires. The wave lengths measured were from 9 to 16 meters, the currents having frequencies from 33,000 to 19,000 kilocycles per second. The apparatus for generating these ultraradio frequency currents is described, as well as the details of the method used in measuring the wave length of the waves which they produce on the parallel wires. A method is also described for calibrating a wave meter at frequencies from 30,000 kilocycles to 352 kilocycles (10 to 850 meters). This method makes use of the harmonics in a second radio-frequency generating set, one of which, when combined with the output from the ultraradio frequency generating set, produces a beat note in a receiving set tuned to the ultraradio frequency. The zero beat-note method is used to obtain an exact setting.

A detailed account of these experiments is given in a paper entitled "A method of measuring very short radio wave lengths and their use in frequency standardization," by F. W. Dunmore and F. M. Engel, which appeared in the Proceedings of the Institute of Radio Engineers, page 467, October, 1923.

DESCRIPTION OF A SERIES OF SINGLE-LAYER INDUCTANCE COILS SUITABLE FOR RADIO-FREQUENCY STANDARDS.

The radio laboratory of the Bureau of Standards has prepared Bureau of Standards Letter Circular No. 103, Description of a Series of Single-Layer Inductance Coils Suitable for Radio-Frequency Standards, which gives specifications for the construction of a complete series of single-layer inductance coils suitable for radio-frequency standards. The series consists of 17 coils having a constant ratio between the successive values of inductance, and the coils are designed to cover the inductance range from 8 to 5,000 microhenries. This, like the other letter circulars, is available only in mimeographed form. A limited number of copies are available for distribution to radio laboratories and manufacturers and others who can show that they have actual use for this material. Requests should be addressed to Bureau of Standards, Washington, D. C.

TESTS OF RADIO RECEIVING SETS (III).

The results of tests on receiving sets made by the radio laboratory of the Bureau of Standards are given in a series of letter circulars which are now being issued. The third of the series is Letter Circular No. 102, which has just been issued. This describes results of tests on a number of short-wave regenerative receiving sets. The second of the series, Letter Circular No. 93, which was previously announced, described the results of tests on a number of receiving sets which utilize crystal detectors. The first letter circular of the series gave results of tests on certain electron tube-receiving sets; copies of this are no longer available. It is believed that the methods followed and the examples given in these reports will be of assistance to manufacturers in the development of methods of testing and describing and improving their products. The particular receiving sets are referred to by arbitrary reference numbers rather than by a statement of the manufacturers' names and type numbers.

This letter circular is available only in mimeographed form, but a limited number of copies are available for distribution to testing laboratories, manufacturers, and others who can show that they are directly concerned with the testing of receiving sets. Requests should be addressed to the Bureau of Standards, Washington, D. C.

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